CLAIMS

We claim:

1. A method for blending images, comprising the steps of:

receiving a first image, said first image includes a first set of pixels;

receiving a second image, said second image includes a second set of pixels and a third set of pixels, said third set of pixels has a predefined attribute indicating that said third set of pixels should not be mixed;

determining which pixels of said second image are part of said second set of pixels and which pixels of said second image are part of said third set of pixels based on said predefined attribute;

for each specific pixel of said first set of pixels that corresponds in position with a pixel from said second set of pixels, accessing a color map based on color of said specific pixel and determining a pixel blending value for said specific pixel based on said accessing said color map, said color map capable of storing blending value information for a plurality of different colors; and

blending said first set of pixels with said second set of pixels based on said pixel blending values.

2. A method according to claim 1, wherein:

said predefined attribute is a transparent color.

3. A method according to claim 1, further including the step of:

updating said color map in real time, said step of blending is performed in real time.

1   4.   A method according to claim 1, further including the step of:

2   adding additional visibly distinct colors to said color map.

1   5.   A method according to claim 1, wherein:

2   said second image is part of a video signal;

3   said step of receiving a second image includes receiving said video signal.

1   6.   A method according to claim 5, wherein:

2   said predefined attribute is a predefined color; and

3   said step of determining which pixels of said video signal are part of said second

4   image comprises the step of identifying which pixels of said video signal are said

5   predefined color.

1   7.   A method according to claim 5, wherein:

2   said predefined attribute is a transparent color; and

3   said step of determining which pixels of said video signal are part of said second

4   image comprises the step of identifying which pixels of said video signal are said

5   transparent color.

1   8.   A method according to claim 1, wherein:

2   said first image is part of a first video signal;

3   said step of receiving a first image includes receiving said first video signal;

4   said second image is part of a second video signal;

5   said step of receiving a second image includes receiving said second video signal.

1   9.   A method according to claim 1, wherein:

2   said color map is a look-up table storing color values and blending information

3   for said color values.

1   10.   A method according to claim 1, wherein:

2   said color map is a look-up table storing ranges of color values and blending

3   information for said ranges.

1   11.   A method according to claim 1, wherein:

2   said steps of receiving a first image, receiving a second image, accessing and

3   blending are performed by one apparatus.

1   12.   A method according to claim 1, further including the step of:

2   receiving additional blending values that are not based on said color map, said

3   step of blending is also based on said additional blending values.

1   13.   A method according to claim 12, wherein:

2   said additional blending values indicate whether to ignore said pixel blending

3   values.

1   14.   A method according to claim 1, wherein said step of blending includes

2   the steps of:

3   creating a matte of said second image;

4   performing a logical AND of said matte and values based on said pixel blending

5   values; and

6   keying said second image with said first image using a key equal to said logical

7   AND of said matte and said values based on blending values.

1   15.   A method according to claim 1, wherein said step of blending includes

2   the steps of:

3   creating a matte of said second image;

4   creating a first composited image by keying said second image with said first

5   image using said a key equal to said matte; and

6   creating a second composited image by keying said first composited image with

7   said first image.

1   16.   A method according to claim 1, wherein:

2   said method is performed in real time during a live event.

1   17.   A method according to claim 1, wherein said step of blending includes

2   the steps of:

3   creating a matte based on said pixel blending values, said matte includes a fourth

4   set of pixels, each pixel in said fourth set of pixels includes a data value, each data value

5   is based on at least a corresponding pixel blending value; and

6   mixing said first image with said second image on a pixel by pixel basis using said

7   matte.

1   18.   A method according to claim 1, wherein:

2   said step of determining a pixel blending value includes reading said pixel

3   blending value from said color map.

1   19.   A method according to claim 1, wherein:

2   said step of determining a pixel blending value includes reading color data from

3   said color map and calculating said pixel blending value from said color data.

1   20.   An apparatus used for blending images, comprising:

2   an input device;

3   an output device;

4   memory; and

5   one or more processors, said one or more processors, said one or more

6   processors perform a method comprising the steps of:

7   receiving a first image, said first image includes a first set of pixels,

8   receiving a second image, said second image includes a second set of

9   pixels and a third set of pixels, said third set of pixels has a predefined attribute indicating

10   that said third set of pixels should not be mixed,

11   determining which pixels of said second image are part of said second

12   set of pixels and which pixels of said second image are part of said third set of pixels

13   based on said predefined attribute,

14   for each specific pixel of said first set of pixels that corresponds in

15   position with a pixel from said second set of pixels, accessing a color map based on

16   color of said specific pixel and determining a pixel blending value for said specific pixel

17   based on said accessing said color map, said color map capable of storing blending

18   value information for a plurality of different colors, and

19   causing a blending of said first set of pixels with said second set of pixels

20   based on said pixel blending values.

1   21   An apparatus according to claim 20, wherein

2   said predefined attribute is a transparent color.

1   22.   An apparatus according to claim 20, wherein said method further

2   includes the step of:

3   updating said color map in real time, said step of blending is performed in real

4   time.

1   23.   An apparatus according to claim 20, wherein said method further

2   includes the step of:

3   adding additional visibly distinct colors to said color map.

1   24.   An apparatus according to claim 20, wherein:

2   said step of determining which pixels of said video signal are part of said second

3   image comprises the step of identifying which pixels of said video signal are a predefined

4   color.

1   25.   An apparatus according to claim 20, wherein said method further

2   includes the step of:

3   receiving additional blending values that are not based on said color map, said

4   step of blending is also based on said additional blending values, said additional blending

5   values indicate whether to ignore said pixel blending values.

1   26.   An apparatus according to claim 20, wherein said step of causing a

2   blending includes the steps of:

3   creating a matte based on said pixel blending values, said matte includes a fourth

4   set of pixels, each pixel in said fourth set of pixels includes a data value, each data value

5   is based on at least a corresponding pixel blending value; and

6   mixing said first image with said second image on a pixel by pixel basis using said

7   matte.

1   27.   A method for blending images, comprising the steps of:

2   storing blending information for a set of visibly distinct colors;

3   receiving a first image, said first image includes a first set of pixels, each pixel of

4   said first set of pixels is associated with color data;

5   receiving a second image, said second image includes a second set of pixels;

6   for each pixel in said first set of pixels, identifying an appropriate subset of said

7   stored blending information based on said color data;

8   creating a matte, said matte includes a third set of pixels, each pixel in said third

9   set of pixels corresponds to at least one pixel in said first set of pixels, each pixel in said

10   third set of pixels includes a data value based on said appropriate subset of said stored

11   blending information for said corresponding at least one pixel in said first set of pixels;

12   and

13   causing a blending of said first image with said second image based on said

14   matte.

1   28.   A method according to claim 27, wherein:

2   said matte is a gray scale image that is part of a video signal.

1   29.   A method according to claim 27, wherein:

2   said first image is a video image; and

3   said second image is a video image.

1   30.   A method according to claim 27, wherein:

2   said blending information includes a color map, said color map stores an

3   identifications of colors and blending values for said colors.

1   31.   A method according to claim 30, wherein:

2   each data value stores one of said blending values.

1   32.   A method according to claim 31, wherein:

2   said step of causing a blending includes the steps of creating an alpha signal

3   based on said matte and transmitting said alpha signal to a keyer;

4   said first image is a video image; and

5   said second image is a video image.

1   33.   A method according to claim 27, wherein said step of causing a blending

2   includes the steps of:

3   accessing a first pixel of said second image;

4   determining whether said first pixel of said second image is part of an effect;

5   outputting a first pixel of said first image, without blending, if said pixel is not part

6   of said effect;

7   outputting a blend of said first pixel of said first image and said first pixel of said

8   second image according to a first a data value in said matte if said first pixel of said

9   second image is part of said effect, said first data value corresponds to a first pixel of

10   said matte, said first pixel of said matte corresponds to said first pixel of said first image

11   and said first pixel of said second image.

1   34.   A method according to claim 27, further comprising the steps of:

2   receiving a third image;

3   displaying said third image;

4   receiving a selection of a portion of said third image, said portion of said third

5   image includes a set of colors; and

6   receiving one or more blending values for said set of colors, said stored different

7   blending information includes said blending values.

1   35.   An apparatus used for blending images, comprising:

2   an input device;

3   an output device;

4   memory; and

5   one or more processors, said one or more processors, said one or more

6   processors perform a method comprising the steps of:

7   storing blending information for a set of visibly distinct colors,

8   receiving a first image, said first image includes a first set of pixels, each

9   pixel of said first set of pixels is associated with color data,

10   receiving a second image, said second image includes a second set of

11   pixels,

12   for each pixel in said first set of pixels, identifying an appropriate subset

13   of said stored blending information based on said color data,

14   creating a matte, said matte includes a third set of pixels, each pixel in

15 said third set of pixels corresponds to at least one pixel in said first set of pixels, each

16 pixel in said third set of pixels includes a data value based on said appropriate subset of

17 said stored blending information for said corresponding at least one pixel in said first set

18 of pixels, and

19   causing a blending of said first image with said second image based on

20 said matte.

1   36.   An apparatus according to claim 35, wherein said step of causing a

2   blending includes the steps of:

3   accessing a first pixel of said second image;

4   determining whether said first pixel of said second image is part of an effect;

5   outputting a first pixel of said first image, without blending, if said pixel is not part

6   of said effect;

7   outputting a blend of said first pixel of said first image and said first pixel of said

8   second image according to a first a data value in said matte if said first pixel of said

9   second image is part of said effect, said first data value corresponds to a first pixel of

10 said matte, said first pixel of said matte corresponds to said first pixel of said first image

    and said first pixel of said second image.

1   37.   An apparatus according to claim 35, wherein:

2   said matte is a gray scale image that is part of a video signal.

1   38.   An apparatus according to claim 35, wherein:

2   said blending information includes a color map, said color map stores an

3   identifications of colors and blending values for said colors.

1   39.   An apparatus for blending a first video image with a second video image,

2   comprising:

3   a pixel blending value calculation circuit receiving said first video image, said

4   pixel blending value calculation circuit includes a color map, said color map stores

5   information indicating blending values for multiple visibly distinct colors, said pixel

6   blending value calculation circuit generates an output based on color in said first video

7   image and said color map; and

8   a blending circuit receiving said first video image and said second video image,

9   said pixel blending circuit in communication with said pixel blending value calculation

10   circuit, said blending circuit mixes said first video image with said second video image

11   based on said output of said pixel blending value calculation circuit.

1   40.   An apparatus according to claim 39, wherein said blending circuit

2   comprises:

3   control logic in communication with said pixel blending value calculation circuit;

4   a first video altering circuit receiving said first video image, said first video

5   altering circuit is in communication with said control logic, said first video altering circuit

6   alters said first video image based on a first set of one or more blending variables

7   received from said control logic;

8   a second video altering circuit receiving said second video image, said second

9   video altering circuit is in communication with said control logic, said second video

10   altering circuit alters said second video image based on a second set of one or more

11   blending variables received from said blending control logic; and

12   a mixing circuit in communication with said first video altering circuit and said

13   second video altering circuit.

1   41.   An apparatus according to claim 39, wherein said pixel blending value

2   calculation circuit comprises:

3   a memory, said memory stores said color map; and

4   a processor in communication with said memory, said processor receives said

5   first video image, accesses said color map based on colors in said first video image and

6   determines said output.

1   42.   An apparatus according to claim 39, wherein:

2   said pixel blending value calculation circuit receives a geometric key signal, said

3   pixel blending value calculation circuit selectively ignores said color map for a given pixel

4   in said first video image in response to said geometric key signal.

1   43.   An apparatus according to claim 39, wherein:

2   said pixel blending value calculation circuit selectively ignores said color map for

3   a particular pixel in said first video image if said particular pixel is of a predetermined

4   color.

1   44.   An apparatus according to claim 39, wherein:

2   said pixel blending value calculation circuit accesses said color map for every

3   pixel of said first video image and generates an output based on said color map for every

4   pixel of said first video image.

1   45.   An apparatus for blending a first video signal with a second video signal,

2   comprising:

3   a memory, said memory stores a color map, said color map stores information

4   indicating blending information for multiple colors;

5   a processor in communication with said memory, said processor receives said

6   first video signal, accesses said color map based on colors in said first video signal and

7   determines blending values based on accessing said color map; and

8   a video blending circuit in communication with said processor, said video

9   blending circuit receives said first video signal and said second video signal, said video

10   blending circuit mixes said first video signal with said second video signal based on said

11   blending values.

1   46.   An apparatus according to claim 45, wherein said blending circuit

2   comprises:

3   control logic in communication with said processor;

4   a first video signal altering circuit receiving said first video signal, said first video

5   signal altering circuit is in communication with said control logic, said first video signal

6   altering circuit alters said first video signal based on a first set of one or more blending

7   values received from said control logic;

8   a second video signal altering circuit receiving said second video signal, said

9   second video signal altering circuit is in communication with said control logic, said

10   second video signal altering circuit alters said second video signal based on a second set

11   of one or more blending values received from said control logic; and

12   a video blending circuit in communication with said first video signal altering

13   circuit and said second video signal altering circuit.

1   47.   An apparatus according to claim 45, wherein:

2   said processor receives a geometric key signal, said processor selectively

3   ignores said color map for a given pixel in said first video image in response to said

4   geometric key signal.

1   48.   An apparatus according to claim 45, wherein:

2   said processor selectively ignores said color map for a particular pixel in said first

3   video image if said particular pixel is of a predetermined color.

1   49.   An apparatus according to claim 45, wherein:

2   said processor accesses said color map for every pixel of a first image in said

3   first video signal and generates an output based on said color map for every pixel of said

4   first image.